

REMARKS

The Office Action dated May 3, 2007 has been received and carefully noted. The following remarks are submitted as a full and complete response thereto.

Claims 1-19 are respectfully submitted for consideration.

The Office Action rejected claims 1-19 under 35 U.S.C. 103(a) as being obvious over US Patent No. 6,452,541 to Zhao et al. (Zhao), in view of US Patent No. 6,166,685 to Soliman (Soliman). The Office Action took the position that Zhao disclosed all of the features of these claims, except a determination of a likely location relative to the station and delay based on the determined likely location and a more accurate location determination at the user equipment. The Office Action asserted that Soliman disclosed this feature. Applicants submit that the cited references, taken individually or in combination, fail to disclose or suggest all of the features recited in any of the pending claims.

Claim 1, from which claims 2-15 depend, is directed to a method of providing information regarding the location of a mobile user. A likely location of the mobile user equipment relative to a station is determined. An estimate of the delay between transmission of a signal from the station and reception of the signal at the mobile user equipment is determined based on the determined likely location. Assistance data from the station is signaled to the mobile user equipment, the assistance data comprising information about the timing of a positioning system. A more accurate location

determination at the user equipment is obtained based on signals from the entities of the positioning system, the assistance data and the estimated delay. The location is determined based on information signaled from entities of a positioning system and assistance data signaled from the station of the communication system.

Claim 16 is directed to a system for determining the location of a mobile user equipment. A positioning system includes entities arranged to signal information, the arrangement being such that the mobile user equipment may receive and use the information from the entities when determining its location. A station of a communication system arranged to transmit information signals to the mobile user equipment. A location estimation unit is configured to provide an estimate of the likely location of the mobile user equipment relative the station. A processor unit is configured to provide an estimate of the delay between transmission of an information signal from the station and reception of the information signal at the mobile user equipment based on the estimated location. A location determination unit is configured to determine the location of the mobile user equipment based on signals from the entities of the position system, and assistance data from the station. The assistance data comprises information about the timing of the positioning system and the estimate of the delay.

Claim 17 is directed to a mobile user equipment. A first receiver is configured to receive information signals from entities of a positioning system for use in location determinations by the mobile user equipment. A second receiver is configured to receive signals from a station of a communication system. A location determination unit is

configured to determine the location of the mobile user equipment based on signals from the entities of the position system, and assistance data signal received from the station. The assistance data includes information about the timing of the positioning system. A computed difference between the time of transmission of the assistance data signal from the station and the time of reception of said assistance data signal at the mobile user equipment, is based on an estimated likely location of the mobile user equipment relative to the base station.

Claim 18 is directed to a system for determining the location of a mobile user equipment. A positioning system including entities arranged to signal information, the arrangement being such that the mobile user equipment may receive and use the information from said entities when determining its location. A station of a communication system is arranged for transmission of information signals to the mobile user equipment. A location estimation means is configured for providing an estimate of the likely location of the mobile user equipment relative the station. A processor means is configured for providing an estimate of the delay between transmission of an information signal from the station and reception of the information signal at the mobile user equipment based on the estimated location. A location determination means is configured for determining the location of the mobile user equipment based on signals from the entities of the position system, and assistance data from the station. The assistance data includes information about the timing of the positioning system and the estimate of the delay.

Claim 19 is directed to a mobile user equipment. A first receiver means is configured for receiving information signals from entities of a positioning system for use in location determinations by the mobile user equipment. A second receiver means is configured for receiving signals from a station of a communication system. A location determination means is configured for determining the location of the mobile user equipment based on signals from the entities of the position system, and assistance data signal received from the station. The assistance data includes information about the timing of the positioning system, and a computed difference between the time of transmission of the assistance data signal from the station and the time of reception of the assistance data signal at the mobile user equipment. The difference is computed based on an estimated likely location of the mobile user equipment relative to the base station.

Applicants submit that each of the above claims recites features that are neither disclosed nor suggested in any of the cited references.

As discussed in previous correspondence, Zhao is directed to a network assisted satellite positioning system based location scheme (see col. 1, lines 62 to 65 of Zhao). Zhao also describes transmitting assistance messages via a network to mobile receivers and discloses transmitting the assistance messages with a GPS time. Indication of a delay occurring between the time the GPS time is applied to the assistance message and the time the assistance message is received at the mobile receiver is disclosed and it is disclosed that this delay will be variable according to the location of the mobile receiver. According to Zhao, a communication network periodically determines a roundtrip delay

between a base station and a mobile station and this can be used to determine the delay incurred by the assistance messages, and used to compensate for the time required to propagate the assistance message to the mobile receiver for example, by adding the delay to the GPS time stamped onto the assistance message (see, for example, column 2, lines 10 to 58 and column 4, lines 19 to 24 of Zhao). However, the Office Action admits that Zhao fails to disclose the feature of “a determination of a likely location relative to the station and delay based on the determined likely location and a more accurate location determination at the user equipment” and relied on Soliman to cure this deficiency.

Soliman is directed to tracking a mobile terminal in which an initial accurate position for the mobile terminal is determined using GPS data. This accurate initial position may be determined using GPS measurements and also infrastructure measurements such as round trip delay (RTD) and signal to noise ratio (SNR). Soliman goes on to state that after obtaining the initial accurate position, subsequent tracking of the mobile terminal is achieved by using only infrastructure measurements. In order to achieve an estimate of the position of the mobile terminal, measurements such as round trip delay and signal to noise ratio are measured and these measurements are used to obtain an estimate of the position of the mobile terminal. The accuracy of this estimate is then determined. If the estimate is within a specified accuracy, then further estimates for the position of the mobile terminal are performed using the infrastructure measurements. Otherwise, if the estimate is not within a specified accuracy, a new accurate position is

determined by using the GPS method used to calculate the initial position of the mobile station.

Applicants submit that the cited references fail to disclose or suggest at least the feature of “determining an estimate of a delay between transmission of a signal from the station and reception of said signal at the mobile user equipment based on the determined likely location” as recited in claims 1, and 16-19. More specifically, Applicants submit that Soliman fails to cure the admitted deficiencies of Zhao.

Soliman merely describes, as discussed above, determining a likely location of a mobile terminal. However, Soliman is silent with regards to using this likely location in order to determine an estimate of a delay between the transmission of a signal from the station and reception of said signal at the mobile user equipment. Rather, Soliman actually describes the reverse, by measuring a delay (for example, RTD), and then using this measurement to estimate the likely location of the mobile user equipment (Po_(INFR)) See col. 4 lines 25-32.

Furthermore, Applicants submit that Soliman does not disclose or suggest at least the feature of “an estimated delay based on a determined likely location is used to correct a location determination from a positioning system” such as GPS, as recited in claims 1 and 16-19. Rather, Soliman merely describes either estimating a position of a terminal based on infrastructure measurement such as round trip delay, or obtaining an accurate position for the mobile terminal using GPS (and optionally infrastructure measurements

such as round trip delay). Neither of these methods is used to correct a location determination from a positioning system.

As discussed above, Applicants submit that the cited references fail to disclose or suggest at least the claimed features of determining a likely location, determining an estimate of a delay based on the determined likely location, and using this estimate to accomplish a more accurate location determination based on signals from entities of a positioning system, assistance data and said estimated delay.

Applicants further submit that because claims 2-15 depend from claim 1, these claims are allowable at least for the same reasons as claim 1, as well as for the additional features recited in these dependent claims.

Based at least on the above, Applicants submit that the cited references fail to disclose or suggest all of the features recited in claims 1-19. Accordingly, withdrawal of the rejection under 35 U.S.C. 103(a) is respectfully requested.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'DEB', is written over a horizontal line.

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